

IFW

DOCKET NO.: UCSD-0019 / SD2003-226-1111

PATENT



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Re Application of:

Michael D. Burkart and James J. LaClair

Confirmation No.: 1801

Application No.: 10/561,108

Group Art Unit: 1652

Filing Date: May 11, 2006

Examiner: Not Yet Assigned

For: **COMPOSITIONS AND METHODS FOR ANALYSIS AND MANIPULATION
OF ENZYMES IN BIOSYNTHETIC PROTEOMES**

DATE OF DEPOSIT: September 8, 2006

I HEREBY CERTIFY THAT THIS PAPER IS BEING
DEPOSITED WITH THE UNITED STATES POSTAL
SERVICE AS FIRST CLASS MAIL, POSTAGE PREPAID,
ON THE DATE INDICATED ABOVE AND IS
ADDRESSED TO THE UNITED STATES PATENT AND
TRADEMARK OFFICE, P.O. BOX 1450, ALEXANDRIA,
VA 22313-1450.

Phillip A. Singer

TYPED NAME: Phillip A. Singer
REGISTRATION NO.: 40,176

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

INFORMATION DISCLOSURE STATEMENT

Pursuant to 37 CFR § 1.56 and in accordance with 37 CFR §§ 1.97-1.98, information relating to the above-identified application is hereby disclosed. Inclusion of information in this statement is not to be construed as an admission that this information is material as that term is defined in 37 CFR § 1.56(b).



In accordance with § 1.97(b), since this Information Disclosure Statement is being filed either within three months of the filing date of the above-identified application, within three months of the date of entry into the national stage of

7

the above identified application as set forth in § 1.491, before the mailing date of a first Office Action on the merits of the above-identified application, or before the mailing date of a first Office Action after the filing of request for continued examination under § 1.114, no additional fee is required.

- ☐ In accordance with § 1.97(c), this Information Disclosure Statement is being filed after the period set forth in § 1.97(b) above but before the mailing date of either a Final Action under § 1.116 or a Notice of Allowance under § 1.311, or before an action that otherwise closes prosecution in the application, therefore:

☐ Certification in Accordance with § 1.97(e) is attached; or

☐ The fee of \$180.00 as set forth in § 1.17(p) is attached.

- ☐ In accordance with § 1.97(d), this Information Disclosure Statement is being filed after the mailing date of either a Final Action under § 1.113 or a Notice of Allowance under § 1.311 but before, or simultaneously with, the payment of the Issue Fee, therefore included are: Certification in Accordance with § 1.97(e); and the submission fee of \$180.00 as set forth in § 1.17(p).

- ☒ Copies of reference numbers 3 - 34 listed on the attached Form PTO-1449 are enclosed herewith.

- ☒ Copies of reference numbers 1 - 2 on the attached Form PTO 1449 are not required to be submitted pursuant to 37 CFR § 1.98(a)(2)(i).

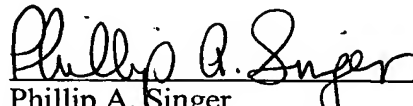
- ☐ Copies of references - are not being submitted because they were previously cited by or submitted to the U.S. Patent and Trademark Office in patent application number , filed for which a claim for priority under 35 U.S.C. § 120 has been made in the instant application.

☐ The relevance of those listed references which are not in the English language is as follows:

There are no listed references which are not in the English language.

Please charge any deficiency or credit any overpayment to Deposit Account No. 23-3050. This form is submitted in duplicate.

Date: September 8, 2006


Phillip A. Singer
Registration No. 40,176

WOODCOCK WASHBURN LLP
One Liberty Place - 46th Floor
Philadelphia, PA 19103
Telephone: (215) 568-3100
Facsimile: (215) 568-3439



| | | |
|--|--|-------------------------------|
| Form PO-1449 Modified List of Patent and Publications Cited by Applicant (Use several sheets if necessary) U.S. Department of Commerce Patent and Trademark Office | Docket No. UCSD-0019 / SD2003-226-111I | Application No. 10/561,108 |
| | Applicant Michael D. Burkart and James J. LaClair | |
| | Filing Date May 11, 2006 | Group 1652 |
| | Confirmation No. 1801 | |

U. S. PATENT DOCUMENTS

| Examiner Initial | | Document No. | Date | Name | Class | Subclass |
|------------------|---|--------------|----------|-----------------|-------|----------|
| | 1 | 2003/0073205 | 04/17/03 | Arlanian et al. | | |
| | 2 | 2002/0055125 | 05/09/02 | Charych et al. | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

FOREIGN PATENT DOCUMENTS

| Examiner Initial | | Document No. | Date | Country | Translation | |
|------------------|--|--------------|------|---------|-------------|----|
| | | | | | YES | NO |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| | |
|-----------------|------------------------|
| EXAMINER | DATE CONSIDERED |
|-----------------|------------------------|

| | | | |
|--|-----------|---|-------------------------------|
| Form PTO-1449 Modified | | Docket No. UCSD-0019 / SD2003-226-1111 | Application No. 10/561,108 |
| List of Patent and Publications Cited by Applicant (Use several sheets if necessary) | | Applicant Michael D. Burkart and James J. LaClair | |
| U.S. Department of Commerce Patent and Trademark Office | | Filing Date May 11, 2006 | Group 1652 |
| | | Confirmation No. 1801 | |
| OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.) | | | |
| | 3 | Ahmed, M.S. et al., "Inhibition of Lactose Transport in <i>E. Coli</i> by N-Ethylmaleimide- β -Galactoside, N-Ethylsuccinimide- β -Galactoside and N-Ethylmaleimide," <i>Membrane Biochem.</i> , 1980 , 3(4), 329-340 | |
| | 4 | Bedford, D.J. et al., "Expression of a Functional Fungal Polyketide Synthase in the Bacterium <i>Streptomyces coelicolor</i> A3(2)," <i>J. Bacteriol.</i> , 1995 , 177(15), 4544-4548 | |
| | 5 | Belshaw, P.J. et al., "Aminoacyl-CoAs as Probes of Condensation Domain Selectivity in Non-ribosomal Peptide Synthesis," <i>Science</i> , 1999 , 284, 486-489 | |
| | 6 | Caffrey, P. et al., "Identification of DEBS 1, DEBS 2 and DEBS 3, the multienzyme polypeptides of the erythromycin-producing polyketide synthase from <i>Saccharopolyspora erythraea</i> ," <i>FEBS Lett.</i> , 1992 , 304(2,3), 225-228 | |
| | 7 | Cane, D.E. et al., "The parallel and convergent universes of polyketide synthases and nonribosomal peptide synthetases," <i>Chem. Biol.</i> , 1999 , 6, R319-R325 | |
| | 8 | Cane, D.E. et al., "Harnessing the Biosynthetic Code: Combinations, Permutations, and Mutations," <i>Science</i> , 1998 , 282, 63-68 | |
| | 9 | Chang, S. et al., "The Roles of Propeptide in Maturation and Secretion of Npr Protease from <i>Streptomyces</i> *, " <i>J. or Biol. Chem.</i> , 1994 , 269(5), 3548-3554 | |
| | 10 | Courtois, S. et al., "Recombinant Environmental Libraries Provide Access to Microbial Diversity for Drug Discovery from Natural Products," <i>Appl. Environ. Microbiol.</i> , 2003 , 69(1), 49-55 | |
| | 11 | Cuatrecasas, P. et al., "Protein Purification by Affinity Chromatography," <i>J. Biol. Chem.</i> , 1970 , 245(12), 3059-3055 | |
| | 12 | Doekel, S. et al., "Review: Biosynthesis of Natural Products on Modular Peptide Synthetases," <i>Metab. Eng.</i> , 2001 , 3, 64-77 | |
| EXAMINER | | DATE CONSIDERED | |

| | | | |
|--|----|---|-------------------------------|
| Form PTO-1449 Modified | | Docket No. UCSD-0019 / SD2003-226-1111 | Application No. 10/561,108 |
| List of Patent and Publications Cited by Applicant (Use several sheets if necessary) | | Applicant Michael D. Burkart and James J. LaClair | |
| U.S. Department of Commerce Patent and Trademark Office | | Filing Date May 11, 2006 | Group 1652 |
| | | Confirmation No. 1801 | |
| OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.) | | | |
| | 13 | Du et al., "The biosynthetic gene cluster for the antitumor drug bleomycin from <i>Streptomyces verticillus</i> ATCC15003 supporting functional interactions between nonribosomal peptide synthetases and a polyketide synthase," <i>Chemistry and Biology</i> , 2000 , 7, 623-642 | |
| | 14 | Du, L. et al., "Biosynthesis of hybrid peptide-polyketide natural products," <i>Curr. Opin. Drug Discov. Devel.</i> , 2001 , 4(2), 215-228 | |
| | 15 | Du, L. et al., "Review: Hybrid Peptide-Polyketide Natural Products: Biosynthesis and Prospects toward Engineering Novel Molecules," <i>Metab. Eng.</i> , 2001 , 3, 78-95 | |
| | 16 | Dueno, E.E. et al., "Cesium Promoted <i>O</i> -Alkylation of Alcohols for the Efficient Ether Synthesis," <i>Tetrahedron Lett.</i> , 1999 , 40, 1843-1846 | |
| | 17 | Edman, P., "Method for Determination of the Amino Acid Sequence in Peptides," <i>Acta Chem. Scand.</i> , 1950 , 4, 283-293 | |
| | 18 | Fenical, W., "New pharmaceuticals from marine organisms," <i>Trends Biotechnol.</i> , 1997 , 15, 339-341 | |
| | 19 | Hutchinson, C.R., "Combinatorial biosynthesis for new drug discovery," <i>Curr. Opin. Microbiol.</i> , 1998 , 1, 319-329 | |
| | 20 | Jones, K.L. et al., "Low-Copy Plasmids can Perform as Well as or Better Than High-Copy Plasmids for Metabolic Engineering of Bacteria," <i>Metab Eng.</i> , 2000 , 2, 328-338 | |
| | 21 | Kao, C.M. et al., "Engineered Biosynthesis of the Complete Macrolactone in Heterologous Host," <i>Science</i> , 1994 , 265, 509-512 | |
| | 22 | Kealey, J.T. et al., "Production of polyketide natural product in nonpolyketide-producing prokaryotic and eukaryotic hosts," <i>Proc. Natl. Acad. Sci. USA.</i> , 1998 , 95, 505-509 | |
| EXAMINER | | DATE CONSIDERED | |

| | | | |
|--|----|---|-------------------------------|
| Form PTO-1449 Modified | | Docket No. UCSD-0019 / SD2003-226-1111 | Application No. 10/561,108 |
| List of Patent and Publications Cited by Applicant (Use several sheets if necessary) | | Applicant Michael D. Burkart and James J. LaClair | |
| U.S. Department of Commerce Patent and Trademark Office | | Filing Date May 11, 2006 | Group 1652 |
| | | Confirmation No. 1801 | |
| OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.) | | | |
| | 23 | Kim, E.S. et al., "Heterologous Expression of an Engineered Biosynthetic Pathway: Functional Dissection of Type II Polyketide Synthase Components in <i>Streptomyces</i> Species," <i>J.Bacteriol.</i> , 1995 , 177(5), 1202-1207 | |
| | 24 | Lambalot, R.H. et al., "A new enzyme superfamily – the phosphopantetheinyl transferases," <i>Chem. Biol.</i> , 1996 , 3, 923-936 | |
| | 25 | Mofid, M.R. et al., "Recognition of Hybrid Peptidyl Carrier Proteins/Acyl Carrier Proteins in Nonribosomal Peptide Synthetase Modules by the 4'-Phosphonantetheinyl Transferases AcpS and Sfp*," <i>J. Biol. Chem.</i> , 2002 , 277, 17023-17031 | |
| | 26 | Mootz, H. et al., "Functional characterization of 4'-phosphopantetheinyl transferase genes of bacterial and fungal origin by complementation of <i>Sacchaomyces cerevisiae</i> <i>lys5</i> ," <i>FEMS Microbiology Letters</i> , 2002 , 213, 51-57 | |
| | 27 | Nielsen, J., "The role of metabolic engineering in the production of secondary metabolites," <i>Curr. Opin. Microbiol.</i> , 1998 , 1, 330-336 | |
| | 28 | Pfeifer, B.A. et al., "Biosynthesis of Polyketides in Heterologous Hosts," <i>Microbiol. Mol. Biol. Rev.</i> , 2001 , 65(1), 106-118 | |
| | 29 | Pugh, E.L. et al., "Studies on the Mechanism of Fatty Acid Synthesis, XIV. The Prosthetic Group of ACYL Carrier Protein and the Mode of its Attachment to the Protein," <i>J. Biol. Chem.</i> , 1965 , 240, 4727-4733 | |
| | 30 | Quadri, L.E et al., "Characterization of Sfp, a <i>Bacillus subtilis</i> , Phosphopantetheinyl Transferase for Peptidyl Carrier Protein Domains in Peptide Synthetases," <i>Biochemistry</i> , 1998 , 37, 1585-1595 | |
| | 31 | Shiina, I. et al., "An Effective Method for the Preparation of Chiral Polyoxy 8-Membered Ring Enone Corresponding to the B Ring of Taxol," <i>Bull. Chem. Soc. Jpn.</i> , 2001 , 74, 113-122 | |
| | 32 | Strohl, W.R., "Review: Biochemical Engineering of Natural Product Biosynthesis Pathways," <i>Metab. Eng.</i> , 2001 , 3, 4-14 | |
| | 33 | Towbin, H. et al., "Electrophoretic transfer of proteins from polyacrylamide gels to nitrocellulose sheets: procedure and some applications," <i>PNAS</i> , 1979 , 76(9), 4350-4354 | |
| | 34 | Witkowski, A. et al., "Structural organization of the multifunctional animal fatty-acid synthase," <i>Eur. J. Biochem.</i> , 1991 , 198, 571-579 | |
| EXAMINER | | DATE CONSIDERED | |